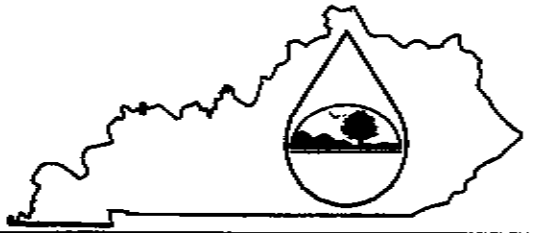
KPDES FORM SDAA



Kentucky Pollutant Discharge Elimination System (KPDES)

Socioeconomic Demonstration and Alternatives Analysis

The Antidegradation Implementation Procedure found in 401 KAR 10:030, Section 1(3)(b)3 requires KPDES permit applications for new or expanded discharges to waters categorized as "Exceptional or High Quality Waters" to conduct a socioeconomic demonstration and alternatives analysis to justify the necessity of lowering local water quality to accommodate important economic or social development in the area in which the water is located. This demonstration shall include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

I. Project Information

Facility Name: Permit 826-0650

Location: Teges, KY	**County: Clay**

Receiving Waters Impacted: Teges Creek

II. Socioeconomic Demonstration

1. **Define the boundaries of the affected community:**
(Specify the geographic region the proposed project is expected to affect. Include name all cities, towns, and counties. This geographic region must include the proposed receiving water.)

The project will affect Oneida, KY and other smaller communities in Clay Co.

2. **The effect on employment in the affected community:**
(Compare current unemployment rates in the affected community to current state and national unemployment rates. Discuss how the proposed project will positively or negatively impact those rates, including quantifying the number of jobs created and/or continued and the quality of those jobs.)

This project will directly employ 8 hourly and 2 salaried individuals. The average rate of pay for these employees will be $19.50/hour or $40,560/year, without overtime. According to Wikipedia.org the median income for families in Clay Co. is $23,488. The jobs created by this project will pay at least 25% more than the average pay expected from other employment in Clay Co. The income created for the individuals employed by this project will raise the quality of life for these individuals. This project will obviously have a beneficial effect on the employment in Clay Co. The current unemployment rate for Clay Co. is 12.7%. The area needs all the employment opportunities available. The Sept. 2009 national unemployment is 9.8% and the KY Sept. 2009 unemployment is 11.1%.

II. Socioeconomic Demonstration- continued

3. **The effect on median household income levels in the affected community:**
(Compare current median household income levels with projected median household income levels. Discuss how proposed project will positively or negatively impact the median household income in the affected community including the number of households expected to be impacted within the affected community.)

The 2007 median household income adjusted for inflation for a family in Clay Co. according to the US census is $24,741. The jobs created by this project will pay at least 25% more than the average pay expected from other employment in Clay Co. The $40,000 in wages and benefits that each of the 9 employees receives will be at least $15000 greater than the median household income. The number of households affected will be at least 7. In addition to the 9 jobs provided by this project, it will also provide more employment indirectly in mining service jobs. Studies indicate that the mining industry create 3 indirectly related jobs for each actual direct mining position.* These jobs include equipment sales, mining engineering consultants, food service, fuel sales, transportation, coal washing and blending.

*Source: university of Kentucky Center for Business and Economic Research: Economic Impact Analysis of Coal in Kentucky, (1995-2004) by Haywood and Baldwin.

4. **The effect on tax revenues of the affected community:**
(Compare current tax revenues of the affected community with the projected increase in tax revenues generated by the proposed project. Discuss the positive and negative social and economic impacts on the affected community by the projected increase.)

The proposed coal mining project will increase tax revenues for Clay Co. The company extracting the coal must pay a 4.5% tax on the sale price of the coal less transportation costs. Approximately 90% of the severance tax is returned to the county from which it has been extracted. The current tax rate of the county will be increased by the additional tax revenues created by the extraction of this coal.

The increased revenues will enable the local governments to extend water and sewer lines and improve roads in the county.

II. Socioeconomic Demonstration- continued

5. The effect on an existing environmental or public health in affected community:
(Discuss how the proposed project will have a positive or negative impact on an existing environmental or public health.)

The project will reclaim an area that was mined prior to 1977. The reclamation of this area will reduce siltation that is entering Teges Cr. The reclamation of this area will also eliminate a highwall that is a safety hazard for the residence of Clay Co. The ponds proposed will catch the runoff from these areas allowing silt to settle. The mining should result in a positive impact to the receiving water by reclaiming the previous mining

6. Discuss any other economic or social benefit to the affected community:
(Discuss any positive or negative impact on the economy of the affected community including direct and or indirect benefits that could occur as a result of the project. Discuss any positive or negative impact on the social benefits to the community including direct and indirect benefits that could occur as a result of the project.)

The project will increase employment in Clay Co., which will be of benefit to Clay Co. For each mining job created there are approximately 3 indirect jobs created. The tons of coal to be mined in the permit area is approximately 50,000. The expected life of the mining is 2 years. The 50,000 tons of coal mined over the 2 years should produce $1,100,000 of revenue for 2 years. Increased production levels lead to increased revenues for both public and private entities. Additional taxes will be made available to local government. The additional taxes will provide water and sewer lines and improve roads and schools locally. Additional income will be available to private citizens by the purchasing of goods and services by the applicant. This income will benefit the citizens by increasing their incomes.

III. Alternative Analysis

1. **Pollution prevention measures:**
(Discuss the pollution prevention measures evaluated including the feasibility of those measures and the cost. Measures to be addressed include but are not limited to changes in processes, source reductions or substitution with less toxic substances. Indicate which measures are to be implemented.)

The applicant proposes constructing three ponds and 18 ditches to intercept runoff from the mining. The ponds and ditches will cost about $120,000. The feasibility of the ponds and ditches is somewhat difficult but is routinely accomplished when mining. The regulations of mining require that runoff pass thru a pond, so there is no alternative.

2. **The use of best management practices to minimize impacts:**
(Discuss the consideration and use of best management practices that will assist in minimizing impacts to water quality from the proposed permitted activity.)

The applicant will have best management practices plan in-place and all persons responsible for implementing the plan will be made familiar with the plan. The plan will include minimizing the size of disturbance at any one time and establishing vegetation on disturbed areas as quickly as possible. The perimeter of the downstream mine areas will be lined with straw bales or silt fence to prevent runoff from leaving the permit area.

3. **Recycle or reuse of wastewater, waste by-products, or production materials and fluids:**
(Discuss the potential recycle or reuse opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

In order to reuse or recycle the water, the only viable option is to use it to spray over the backfill to promote vegetative growth or dust suppression. The runoff captured by the proposed ponds will be used for dust suppression on the mine. The runoff captured by the proposed ponds will also be used to fill the hydroseeder when seeding the reclaimed areas. The reuse of the runoff for dust suppression and filling the hydroseeder would be less than 5% of the total runoff.

III. Alternative Analysis - continued

4. **Application of water conversation methods:**
(Discuss the potential water conservation opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

Water conservation will be implemented by using water captured by the pond as dust suppression. The water will be pumped into trucks and distributed onto areas of the permit that have the potential to create fugitive dust. Water captured by the pond will also be used to fill the hydroseeder when permit areas are to be seeded. Both of these uses will use a very small percentage of the annual runoff. The cost of dust suppression and use of the hydroseeder is approximately $10,000 annually.

5 **Alternative or enhanced treatment technology:**
(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

See attachment.

Kentucky Pollutant Discharge Elimination System

III Alternative Analysis

S. Alternative or enhanced treatment technology:

(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

The surface mining regulations require the permittee to capture the runoff from the permit area and treat this runoff to meet effluent limitations and to reduce peak discharges during mining in comparison to the pre-mining peak discharges. The permit proposes three ponds to capture the runoff. Some of the permit area will have to be diverted to be captured by the ponds. The ditches and ponds to be constructed will cost approximately $120,000.

One alternative to the above method would be install a water treatment plant. The total runoff from the permit area on a daily basis will be approximately 163 gallons/minute. A treatment plant to treat this amount of water would cost at least 1 million dollars. This alternative was eliminated due to the expense.

Enhanced treatment was also considered for the project. Limestone dosing, anoxic limestone drains, limestone diversion wells are designed for acid mine drainage. The geologic sampling at this site found no acid bearing material so these treatments were not considered necessary.

Constructed wetlands were also considered, but due to the topography it is not feasible to obtain the land necessary to install the wetlands and have the wetlands functioning in the amount of time before mining would begin, so this treatment was eliminated.

The method chosen to treat the runoff from the permit is the construction of the ponds and ditches at a cost of approximately $120,000.

III. Alternative Analysis - continued

6. **Improved operation and maintenance of existing treatment systems:**
(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

See attachment.

7. **Seasonal or controlled discharge options:**
(Discuss the potential of retaining generated wastewaters for controlled releases under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity. Compare the feasibility and cost of such a management technique with the feasibility and cost of the proposed treatment system.)

The generated waste waters include the flow from the mining disturbance and the flow from forestland that will be captured by the sediment pond. To capture the flow and hold it until the receiving water has greater assimilative capacity is very difficult and expensive. The runoff from a large storm would have to be held in a structure until the assimilative capacity of the receiving stream is deemed appropriate. The water held in the pond would have to be pumped. Each time the pumping equipment would have to be hauled to the site and a power supply provided. The cost to build the structure of sufficient capacity to hold at least a 25 year storm and the cost of pumping the water along with making a judgment of the assimilative capacity of the receiving stream would be expensive and cumbersome on the operation and was not considered a reasonable alternative.

III. Alternatives Analysis

6. Improved operation and maintenance of existing treatment systems:
(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

To capture the runoff and divert the water through pipes to the Booneville Municipal treatment systems would require the laying of pipe for almost 15 miles. The cost to lay pipe of sufficient size and at sufficient depth and to cross the streams and roads to get to Booneville would average $10/foot ($5/ft for materials and $5/ft. for installation) and would cost $10(15)5280 = $792,000. This cost would offset the net income expected from this mining. Catch basins with drop inlets would also be needed to capture the runoff and channel the water into the sewer lines. These structures would cost at least another $10,000 to 20,000.

The permit proposes three ponds to capture the runoff. Some of the permit area will have to be diverted to be captured by the ponds. The ditches and ponds to be constructed will cost approximately $120,000. The ponds are designed using the computer modeling program SEDCAD. This program predicts the hydrology and sedimentology of the runoff from the permit area. This program predicted that the ponds would have an 24 hour arithmetic average of settleable solids of less than .5 ml/l during the 10 year 24 hour storm. This program also predicted that the ponds reduce peak discharge during mining from the predicted peak discharge before mining for the 25 year 6 hour storm. The ponds capability to capture silt from the runoff is based largely on the detention time of the runoff in the pond. The cost to construct the ditches and ponds based on the runoff from the SEDCAD program is expected to be approximately $120,000.

One could increase the detention time within the pond by making the impounding capacity larger. This enhancement was considered but with the expense of constructing the pond with more capacity, given the limited amount of space available for the ponds and the increased cost of construction this enhancement was not implemented. It was estimated that to remove the additional 1 acre foot or 1613 cubic yards of material to increase the capacity for each pond at $3/cubic yard would add $4800 to the construction costs of each pond.

Another way to increase detention time within the pond would be to install baffles, that would lengthen the flow path of the runoff in the pond. Given the expense and maintenance requirements for the ponds this enhancement was eliminated. It was estimated it would cost $3000 to install baffles in each pond and annual maintenance in each pond would be $1000.

8. Land application or infiltration or disposal via an Underground Injection Control Well

In order to reuse or recycle the water, the only viable option is to use it to spray over the backfill to promote vegetative growth or dust suppression. The runoff captured by the proposed ponds will be used for dust suppression on the mine. The runoff captured by the proposed ponds will also be used to fill the hydroseeder when seeding the reclaimed areas. The reuse of the runoff for dust suppression and filling the hydroseeder would be less than 5% of the total runoff.

Subsurface disposal would entail allowing the water to run into underground mines in the area or drilling holes from the surface to underground mine voids. There are no underground mine voids within 0.5 miles of the proposed operation. To capture the runoff expected from this would require constructing a detention facility. The facility would have to hold at least the runoff from three days. To capture the runoff from 52 acres, would require the construction of a facility at a cost of approximately $35,000. The underground mines in the vicinity of the permit area mined the Horsecreek seam which outcrops above drainage in the area. In order to inject water from the operation into the underground mine would require obtaining permission from the Environmental Protection Agency (EPA). The EPA does not allow underground injection in mines that are above drainage. Since the EPA would not allow the runoff to be discharged into the nearby underground mines, an injection well would have to be drilled. The subsurface in this area is shale, sandstone, clay and coal that has a high cohesion and a small pore space. The available pore space to accommodate the runoff from this site is insufficient to inject the runoff into wells, so this option was eliminated from consideration.

On-site disposal entails the information given in question 4 regarding settlement. This is the method chosen for this project.

9. Discharge to other treatment systems

There are treatment facilities for other surface mines in the area but are located in watersheds that would not intercept runoff from the proposed mine. There are no municipal or other treatment facilities within 8 miles of the proposed mine. The nearest downstream municipal system is located at Booneville, KY about 15 miles from the permit area.

To capture the runoff and divert the water through pipes to the Booneville Municipal treatment systems would require the laying of pipe for almost 15 miles. The cost to lay pipe of sufficient size and at sufficient depth and to cross the streams and roads to get to Booneville would average $10/foot ($5/ft for materials and $5/ft. for installation) and would cost $10(15)5280 = $792,000. This cost would offset the net income expected from this mining. Catch basins with drop inlets would also be needed to capture the

runoff and channel the water into the sewer lines. These structures would cost at least another $10,000 to 20,000.

To intercept the runoff from the proposed mining area and get it to other surface mine treatment facilities in the area would require either capturing the runoff and pumping it into a truck to be hauled to the treatment facility or capturing the runoff and pumping it into waterlines to carry the runoff to the treatment facilities at other surface mines. The average runoff over a year for an acre of forested land in Clay Co. is 40/12(.73) = 2.43 acre/feet.

The closest surface mine that is currently treating water is approximately 8 miles from the proposed discharge. The runoff would first have to be captured. This would involve constructing ponds to capture the runoff. It would cost at least $10,000 to construct a pond with the capacity required to hold the runoff before trucking. After capturing the runoff the water would need to be pumped into trucks. According to the Agriculture Dept. it costs $42 to pump 325,851 gallons. It would cost the applicant $42(87,317,490/325,851) = $11,254/year to pump the runoff into trucks. The trucks would then carry the water to the treatment facility. The runoff from the mine will generate approximately 239,226 gallons per day. The capacity of a truck to carry the water to the treatment plant is 2500 gallons if the weight limit for the truck is 21,000 lbs. The number of trips required by a truck with this capacity would be 239,226/2500 =96. The number of miles for the 96 trips would be 30(96) = 2880. The cost per mile for this size truck is approximately .75/mile or 2880(.75) = $2160/day or 364($2160) = $786,240 year. These costs would exceed the anticipated profit from the mine.

III. Alternative Analysis - continued

8 **Land application or infiltration or disposal via an Underground Injection Control Well**
(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of .proposed treatment system.)

See attachment

9 **Discharge to other treatment systems**
(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

See Attachment

IV Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Signature:	Marquetta Hensley	**Date:**	5-6-10